UNIT - FORAGES

Lesson 7: Establishing and Managing Warm Season Annuals

TEACHING PROCEDURES

A. Review
   Review previous lessons.

B. Motivation
   Warm season annuals are excellent supplemental forages for summer grazing. They are heat tolerant and very productive.

C. Assignment

D. Supervised Study

E. Discussion

Have students list and discuss the characteristics of the three groups of warm season annuals used for forage. Write the characteristics on the board.

What are three general groups of warm season annuals and characteristics?

1) Sudangrass (and hybrid sudangrasses)
   a) Finer stems and higher digestibility
   b) Lower yields
   c) Lowest in prussic acid potential
   d) More forage (but higher acid potential) in hybrids
   e) Animal performance the same for sudangrasses sudangrass hybrids
   f) Common varieties: piper and greenleaf

2) Pearl millet (cattail millet)
   a) No prussic acid danger
   b) Animal performance good
   c) Lowers butterfat levels in dairy cows
   d) May be difficult to obtain seed

3) Sudan-sorghum crosses
   a) Widely available from commercial sources
   b) Highest yielding (50 percent is stem)
   c) Lowest animal performance
   d) Greatest potential for prussic acid poisoning

2. Ask students to outline steps for seed bed preparation and seeding of these warm season annuals. Write key points on the board.

Discuss the seeding of warm season annuals.
1) Seed bed preparation is the same as for other row crops such as corn and beans.

2) Seeding
   a) Drill 20 to 25 pounds of seed per acre in 8-inch rows.
      (1) Heavy seeding reduces stem size.
      (2) Reduced stem size provides higher digestibility.
   b) Broadcast seed may be mixed with fertilizer or used alone.
      (Cultipack or harrow after seeding.)
   c) Seed about mid-May.
      (1) Soil needs to be warm, about 65°F at four inch depths for sorghums.
      (2) Soil needs to be about 70°F at four inch depths for millet.
   d) If seeded later (June), yields will be reduced.

3. Ask student to outline fertility management of warm season annual forages. Write key points on the board.

   **What are the fertility needs of warm season annuals?**
   
   1) Test soil to determine needs.
   2) Apply potassium and phosphorus at rates similar to corn.
   3) High rates of nitrogen are required. (Apply in two or three split applications to avoid nitrate poisoning.)
   4) Apply potassium and phosphorus when preparing seed bed and include 50 to 80 pounds of nitrogen per acre; then apply another 40 to 50 pounds after harvesting or grazing.

4. Have the students discuss how they have used warm season annual pastures and what grazing system was utilized. Compare the various systems and emphasize the recommended system.

   **What grazing management system is recommended for warm season annual forages?**
   
   1) Best response is obtained from rotational grazing.
      a) Graze when plants reach a height of 15 to 20 inches.
      b) Shorter plants provide greater danger of prussic acid poisoning.
   2) Graze plants in one area down to a four inch stubble over a period of about seven days; then move the animals to another area and allow the plants to regrow. (This enhances animal and plant growth.)

5. Discuss the merits of using the warm season annuals for hay or silage. Outline key points for making hay and silage. Write these on the board. Emphasize the difficulty of curing sorghum and pearl millet for hay.

   **What are some considerations for using warm season annuals as a hay or silage crop?**
   
   1) Sudangrass and crosses are not very good for hay and silage. (Sudangrass would be the first choice, then hybrid sudangrasses and crosses last.)
   2) Hay quality is best at the 36-inch stage of growth rather than waiting until the grasses are headed.
a) Crude protein content falls rapidly after reaching 36 inches in height (from 12 to 14 percent to 6 to 7 percent at dough stage).
b) Harvesting after the dough stage is seldom worth the expense.

3) All three groups are difficult to cure without high nutrient losses.
   a) Energy levels are generally low.
   b) Crude protein content is usually low.
   c) Sorghums and pearl millet are extremely hard to cure, as compared to conventional hay crops.

4) Making hay from these crops requires special considerations.
   a) Use of a conditioner is a must.
   b) You should not overcrush the stems.
      (1) Use more roller pressure.
      (2) Drive slowly in a low gear and run at maximum engine speed.
   c) Don't windrow until all plants on top are dry enough for baling.
   d) Don't drive on conditioned material.

6. Ask student to discuss prussic acid poisoning and nitrate poisoning in regard to feeding the warm season annuals. Emphasize precautions to avoid a dangerous situation and discuss how the substances build up in the forage.

How do prussic acid (HCN) and nitrate poisoning occur?

1) Prussic acid or hydrogen cyanide (HCN) poisoning
   a) Plant cells contain dhurrin and emulsen.
   b) When plant cells are immature or crushed from drought or frost, dhurrin and emulsen form HCN.
   c) Dhurrin and emulsen are prevalent in young cells (when plants are less than twenty inches tall), especially in the leafier parts of the plants.
   d) Ruminants are more susceptible than pigs or horses.
   e) HCN release differs greatly among the different sorghum types. (There is also prussic acid danger with pearl millet.)
   f) HCN dissipates as hay cures; therefore, wait until it is all dry to bale.

2) Nitrate poisoning
   a) This usually occurs when a high rate of nitrogen fertilizer is applied at one time and drought follows.
   b) Nitrate levels are highest in the lower portions of the stems and lower in the leaves and younger growth.
   c) Nitrates do not dissipate from hay or stubble, so a problem can occur when feeding these materials.
   d) Nitrate poisoning can occur with pearl millet, sudangrasses and crosses.

7. Ask students what measures can be taken to minimize the threat of HCN and nitrate poisoning. List these points on the board.

What steps can be taken to minimize HCN and nitrate poisoning?

1) Test for poisoning.
2) Dilute suspected forage with other feeds.
3) High energy grains counteract effects of poisoning.
4) Allow plants to become taller and more mature.
5) Allow hay to completely dry before baling.
6) Be especially cautious of plants that are wilted after a frost or drought; wait three or four days for plants to look normal again.
7) Allow tillers and stubble to completely dry and cure before grazing.

F. Other Activities

Grow plots of the various warm season forage annuals for comparison.

2. Test plants for HCN and nitrate levels.

G. Competency

Identify basic principles for establishing and managing warm season annuals for forage.

H. Answers to Evaluation

1. c
2. a
3. b
4. c
5. mid-May
6. High
7. rotational
8. 15-20
9. prussic acid, nitrate
10. false